

What is claimed is:

1. A cathodic protection compound to protect a metal substrate,
comprising:
 - 5 (a) inherently conductive polymer comprising polyaniline-grafted-lignosulfonic acid;
 - (b) metal particles wherein the metal is less noble than metal of the metal substrate; and
 - (c) binder,
- 10 wherein the amount of inherently conductive polymer is less than 1 weight percent of total solids of the compound and wherein the amount of metal particles is less than 20 percent of the total solids of the compound.
2. The compound of Claim 1, wherein the amount of inherently
15 conductive polymer ranges from an electrically effective amount to less than 0.8 weight percent of total solids of the compound.
3. The compound of Claim 1, wherein the amount of inherently
conductive polymer ranges from 0.14 weight percent to 0.5 weight percent of
20 total solids of the compound.
4. The compound of Claim 1, wherein the metal particles have an average particle size ranging from about 1 μm to about 25 μm .
- 25 5. The compound of Claim 1, wherein the metal substrate comprises iron and the metal particles are selected from the group consisting of zinc, aluminum, tin, and combinations thereof.
6. The compound of Claim 1, wherein the binder is a flowable material.

30

7. The compound of Claim 6, wherein the flowable material is electrically inactive.

5 8. The compound of Claim 6, wherein the flowable material is electrically active.

9. The compound of Claim 8, wherein the flowable material includes electrically active, galvanically inactive materials selected from the group consisting of carbon fibers, carbon particles, carbon nanotubes, and
10 combinations thereof.

10. The compound of Claim 1, wherein the weight ratio of total solids of inherently conductive polymer to metal particles can range from about 20:1 to about 40:1.
15

11. A solid concentrate consisting essentially of a blend of inherently conductive polymer particles and anodic metal particles, wherein the inherently conductive polymer particles comprise less than 5 weight percent of the concentrate and wherein the anodic metal particles comprise more than 95
20 weight percent of the concentrate.

12. The concentrate of Claim 11, wherein the metal particles have an average particle size ranging from about 1 μm to about 25 μm .

25 13. The concentrate of Claim 12, wherein the metal particles are selected from the group consisting of zinc, aluminum, tin, and combinations thereof.

14. The concentrate of Claim 11, wherein the inherently conductive
30 polymer is doped polyaniline.

15. The concentrate of Claim 11, wherein the inherently conductive polymer is polyaniline-grafted-lignosulfonic acid.

5 16. The concentrate of Claim 11, wherein the weight ratio of total solids of inherently conductive polymer to metal particles can range from about 20:1 to about 40:1.

10 17. A method of using a cathodic protection compound for a metal substrate, comprising the steps of:

 (a) selecting a cathodic protection compound of Claim 1, wherein the metal particles are less noble than metal of the metal substrate, and

 (b) applying the cathodic protection compound to the metal substrate.

15